

**Amendments to the Specification:**

Please amend page 1, line 1 through page 4, line 8 to read as follows:

**Description**  
**Lubricating Oil Composition**

**TITLE OF THE INVENTION**

**Lubricating Oil Composition**

**CROSS-REFERENCE TO RELATED APPLICATION**

**This application is a continuation of International Application No.**

**PCT/JP02/09123, filed September 6, 2002, the disclosure of which is incorporated herein by reference.**

**{Technical Field}**

**BACKGROUND OF THE INVENTION**

This invention relates to lubricating oil compositions and more particularly to those which have excellent anti-wear properties and a long fatigue life, suitable for transmissions for automobiles.

**{Background Art}**

An automatic transmission for automobiles comprises a torque converter, a planetary gear unit, bearings, a wet clutch, and a hydraulic control unit controlling these components. However, in recent years, automatic transmissions have been susceptible to more severe load than ever due to the progresses of the development of high-powered engines and of the downsizing of automatic transmissions. Lubricating oils to be filled into such transmissions, i.e., transmission oils are required to have excellent extreme pressure properties and anti-wear properties while maintaining a high lubricity and a long fatigue life which is an ability to prevent pitching or flaking (defects at the lubricated surface because of being damaged) in bearings and gears for a long period of time.

In order to meet such requirements, it is known that for example lubricating oils such as automotive transmission oils are blended with sulfur- or phosphorus-based additives having excellent extreme pressure properties and anti-wear properties. While sulfur-based additives are excellent in extreme pressure properties, they can not avoid wears caused by corrosion and abrasion due to their strong activity to metal surfaces, leading to a problem when

they are used alone. On the other hand, phosphorus-based additives are less in wear caused by corrosion and abrasion due to their weaker activity to metal surfaces, than the sulfur-based additives but often have problems due to the lack of extreme pressure properties to avoid pitching or flaking when they are used alone in automatic transmissions where extreme pressure properties are required to be exhibited under severe conditions.

#### BRIEF SUMMARY OF THE INVENTION

In view of the foregoing circumstances, the object of the present invention is to provide a lubricating oil composition, particularly suitable as an automotive transmission oil, which is excellent in anti-wear properties and capable of inhibiting pitching, resulting in an improved fatigue life.

#### {Disclosures of the Invention}

After an extensive research and study, it was found that the use of the combination of specific boron-containing ashless dispersants, alkaline earth metal-based detergents, and sulfur-based additives enables to produce a lubricating oil composition which is improved in anti-wear properties and capable of preventing pitching, resulting in an improved fatigue life.

That is, according to the present invention, there is provided a lubricating oil composition which comprises a lubricating base oil, (A) a boron-containing ashless dispersant in an amount of 0.004 to 0.05 percent by mass in terms of boron, based on the total mass of the composition, (B) an alkaline earth metal-based detergent with a base number of 0 to 500 mgKOH/g in an amount of 0.01 percent by mass or more in terms of an alkaline earth metal, based on the total mass of the composition, and (C) a sulfur-based additive in an amount of 0.01 to 0.3 percent by mass in terms of sulfur, based on the total mass of the composition.

In the present invention, Component (A) is preferably a succinimide modified with a boron compound.

Component (B) is preferably an alkaline earth metal calcium or an alkaline earth metal magnesium.

Component (B) is preferably sulfonate or salicylate.

Component (C) is preferably at least one compound selected from the group consisting of (C-1) thiazole compounds, (C-2) thiadiazole compounds, (C-3) dithiocarbamate compounds, (C-4) molybdenum dithiocarbamate compounds, (C-5) dihydrocarbylpolsulfide compounds, and (C-6) sulfurized ester compounds.

The lubricating oil composition is preferably used in transmissions for automobiles.

DETAILED DESCRIPTION OF THE INVENTION